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1	BRS	L1	1186	logic\$5 adj5 eras\$5	USPAT	2001/10/02 14:56
2	BRS	L2	364	1 and (disc or disk)	USPAT	2001/10/02 14:56
3	BRS	L3	26	2 and 360/\$6.ccls.	USPAT	2001/10/02 15:01
4	BRS	L4	0	2 and pma	USPAT	2001/10/02 15:01
5	BRS	L5	26	2 and (management adj5 area)	USPAT	2001/10/02 15:02

CLASS 707, DATA PROCESSING: DATABASE AND FILE MANAGEMENT OR DATA STRUCTURES

CLASS DEFINITION

This is the generic class for data processing apparatus and corresponding methods for the retrieval of data stored in a database or as computer files.

This class provides for data processing means or steps for organizing and inter-relating data or files (e.g., relational, network, hierarchical, and entity-relationship models).

This class also provides for data processing means or steps for generic data, file and directory upkeeping, file naming, and file and database maintenance including integrity consideration, recovery, and versioning.

Class 707 is structured into three main divisions:

A. Database and file accessing.

B. Database schema and data structure.

C. File and database maintenance.

See Subclass References to the Current Class, below, for the location of subclasses within these three main divisions.

RELATIONSHIP WITH OTHER CLASSES

A. Database and File Accessing

(1) Note. This class area is directed to computerized database and file accessing and retrieval, including hierarchical, bit-mapped and flat indexing, hashing, stapling, containerizing, and other methods. Accessing and control of a memory, per se, is classified elsewhere. See the search class notes in References to Other Classes, below.

(2) Note. The combination of details of database technology with the business data processing is classified in the business art. See search class notes in References to Other Classes, below.

(3) Note. The combination of details of database technology with a nominal recitation of the subject matter of another class is classified herein. Particular fields of use of database technology performing in combination with the basic subject matter of another class to effect some end other than mere information accessing or retrieval, is classified with the subject matter of the other class, unless specifically excluded therefrom. See the search class notes in References to Other Classes, below.

(4) Note. This class area is directed to generic methods and apparatus for accessing and retrieving data housed in either databases or files. The generic steps to access and retrieve an object from an object-oriented database may be properly classified herein; however, objects themselves for an application other than database accessing and retrieving data, such as, for example an operator interface object, an icon object capable of instantiating a process, or a simulation system physical structure object are classified elsewhere. See the search class notes in References to Other Classes, below.

(5) Note. This class area is directed to generic methods and apparatus for accessing and retrieving data housed in either databases or files. The generic steps of accessing and retrieving data or information in a particular computer design "environment" may be properly classified herein. Examples of such "environments" include, for example, a computer aided design (CAD) and analysis tool "environment", a software development tool "environment", an

image processing "environment", a desk-top or other operator interface "environment", etc., may rely on accessing and retrieving information or routines from libraries while working in the "environment". The "environments" themselves are classified elsewhere in the data processing arts. See the search class notes in References to Other Classes, below.

(6) Note. The combination of a database accessing method with a particular operator interface feature may be found in these subclasses. Operator interfaces, per se, are classified elsewhere. See the search class notes in References to Other Classes, below.

B. Database Schema and Data Structures

(1) Note. Classification herein requires a combination of a data structure and the access or retrieval method, or apparatus for employing or storing the data structure.

C. File and Database Maintenance

(1) Note. This class area is directed to means and steps for handling of generic files and databases only in computers and digital data processing systems. For the purpose of these definitions a generic file is defined as a named collection of data. File content and database content authoring, generating, producing, and editing in information processing applications art areas, such as, for example, business data processing machine translation, graphics processing, simulation, animation and software development, is classified elsewhere.

(2) Note. This class area is directed to management and maintenance of files and databases in computers and digital data processing systems and accepts subject solutions working within single memories and across multiple memories. Memory accessing and control and memory management, per se, is classified elsewhere.

(3) Note. This class area is directed to management and maintenance of files and databases in computers and digital data processing systems and accepts only nominal recitations to operator interfaces, icons, and other metaphors used in the maintenance of files and databases. File management tools, metaphors, or objects with significant operator interface features are classified elsewhere.

(4) Note. Formatting and file allocation in memory systems, such as direct access storage systems, is generally found in the art area directed to the storage system device.

SUBCLASS REFERENCES TO THE CURRENT CLASS

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 1 through 10 for database and file accessing.
- 100 through 104.1 for database schema and data structure.
- 200 through 206 for file and database maintenance.

REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 235, Registers, various subclasses for basic machines and associated indicating mechanisms for ascertaining the number of movements of various devices and machines, plus machines made from these basic

machines alone (e.g., cash registers, voting machines), and in combination with various perfecting features, such as printers and recording means. In addition, search Class 235 for various data bearing record controlled systems.

- 345, Computer Graphics Processing, Operator Interface Processing, and Selective Visual Display Systems, subclass 700- 867 for operator interfaces, subclasses 418-475 for computer graphics processing, subclasses 1.1-111 for visual display systems with selective electrical control including display memory organization and structure for storing image data and manipulating image data between a display memory and display device.
- 358, Facsimile and Static Presentation Processing, appropriate subclasses for transmitting, processing, or reproducing a permanent picture.
- 379, Telephonic Communications, various subclasses for two-way electrical communication of intelligible audio information of arbitrary content over a link including an electrical conductor.
- 381, Electrical Audio Signal Processing Systems and Devices, various subclasses for wired one-way audio systems, per se.
- 382, Image Analysis, various subclasses for operations performed on image data with the aim of measuring a characteristic of an image, detecting variations, detecting structures, or transforming the image data, and for procedures for analyzing and categorizing patterns present in image data.
- 600, Surgery, subclass 300- 595 for diagnostic testing applications of computers in the life sciences including patient monitoring and medical imaging.
- 700, Data Processing: Generic Control Systems or Specific Applications, subclass 1- 89 for data processing generic control systems, and subclasses 90-306 for applications of computers in various environments.
- 702, Data Processing, Measuring, Calibrating, or Testing, appropriate subclasses for the application of computers in measuring and testing.
- 703, Data Processing: Structural Design, Modeling, Simulation, and Emulation, subclass 3- 22 for data processing simulation.
- ~~704, Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression /Decompression, subclass 1- 10 for linguistics.~~
- 705, Data Processing: Financial, Business Practice, Management, or Cost /Price Determination, appropriate subclasses for business data processing.
- 706, Data Processing: Artificial Intelligence, appropriate subclasses for artificial intelligence in general.
- 708, Electrical Computers: Arithmetic Processing and Calculating, subclass 1- 9 for hybrid computers, subclasses 100 through 714 for calculators, digital signal processing and arithmetical processing, per se, and subclasses 800 through 854 for electric analog computers.

- 711, Electrical Computers and Digital Processing Systems: Memory, subclass 1- 6 for addressing particular memory configurations and systems, subclasses 100 through 173 for memory accessing and control, per se, (in particular subclasses 113 for disk caching, subclasses 117 through 146 for hierarchical memory, per se, (including caching), subclasses 147 through 153 for shared memory accessing and control, subclasses 154 through 166 for memory control, maintenance and management techniques (including subclasses 161 and 162 for archiving and backup under memory accessing and subclasses 163 and 164 for memory access limiting), and subclasses 170 through 173 for memory configuring and allocation), and subclasses 200 through 221 for address formation processing, particularly subclass 216 for address hashing.
- 715, Data Processing: Presentation Processing of Document, appropriate subclasses for document presentation processing.
- 717, Data Processing: Software Development, Installation, and Management, appropriate subclasses for data processing software development tool.

GLOSSARY

The terms below have been defined for purposes of classification in this class and are shown in underlined type when used in the class and subclass definitions. When these terms are not underlined in the definitions, the meaning is not restricted to the glossary definitions below.

ADDRESS DATA

Data that represent or identify a source or destination. (Also see Data)

COMPUTER:

A machine that inputs data, processes data, stores data, and outputs data.

DATA

Representation of information in a coded manner suitable for communication, interpretation, or processing. See Address Data, Instruction Data, Status Data, and User Data in this Glossary.

DATABASE

A collection of data arranged for ease of storage, retrieval, updating, searching and sorting by computerized means.

DATA PROCESSING

See Processing, below.

DIGITAL DATA PROCESSING SYSTEM:

An arrangement of processor(s) in combination with either memory or peripherals, or both, performing data processing.

FILE

A named collection of data.

INFORMATION

Meaning that a human being assigns to data by means of the conventions applied to that data.

INSTRUCTION DATA

Data that represent an operation and identify its operands, if any. (Also see

Data)

MEMORY

A functional unit to which data can be stored and from which data can be retrieved.

PERIPHERAL

A functional unit that transmits data to or receives data from a computer to which it is coupled.

PROCESSING

Methods or apparatus performing systematic operations upon data or information exemplified by functions such as data or information transferring, merging, sorting, and calculating (i.e., arithmetic operations or logical operations).

- (1) Note. In this class, the glossary term data is used to modify processing in the term data processing; whereas the term digital data processing system refers to a machine performing data processing.
- (2) Note. In an effort to avoid redundant constructions, in this class, where appropriate, the term address data processing is used in place of address data data processing.

PROCESSOR

A functional unit that interprets and executes instruction data.

STATUS DATA

Data that represent conditions of data, computers, peripherals, memory, etc. (Also see Data)

USER DATA

Data other than address data, instruction data, or status data. (Also see Data)

SUBCLASSES**1 DATABASE OR FILE ACCESSING:**

This subclass is indented under the class definition.

Subject matter directed to the retrieval of data stored in a database or as computer files, where a file is defined as a named collection of data.

- (1) Note. This class is directed to computerized database and file accessing and retrieval, including hierarchical, bit-mapped and flat indexing, hashing, stapling, containerizing, and other methods. Accessing and control of a memory, per se, is classified elsewhere. See the search class notes below.
- (2) Note. The combination of details of database technology with the business data processing is classified in the business art. See search class notes below.
- (3) Note. The combination of details of database technology with a nominal recitation of the subject matter of another class is classified herein. Particular fields of use of database technology performing in combination with the basic subject matter of another class to effect some end

other than mere information accessing or retrieval is classified with the subject matter of the other class, unless specifically excluded therefrom. See the search class notes below.

- (4) Note. This class is directed to generic methods and apparatus for accessing and retrieving data housed in either databases or files. The generic steps to access and retrieve an object from an object-oriented database may be properly classified herein; however, objects themselves for an application other than database accessing and retrieving data, such as, for example an operator interface object, an icon object capable of instantiating a process, or a simulation system physical structure object are classified elsewhere. See the search class notes below.
- (5) Note. This class is directed to generic methods and apparatus for accessing and retrieving data housed in either databases or files. The generic steps of accessing and retrieving data or information in a particular computer design "environment" may be properly classified herein. Examples of such "environments" include, for example, a computer aided design (CAD) and analysis tool "environment", a software development tool "environment", an image processing "environment", a desk-top or other operator interface "environment", etc., may rely on accessing and retrieving information or routines from libraries while working in the "environment". The "environments" themselves are classified elsewhere in the data processing arts. See the search class notes below.
- (6) Note. The combination of a database accessing method with a particular operator interface feature may be found in these subclasses. Operator interfaces, per se, are classified elsewhere. See the search class notes below.
- (7) Note. KEYWORDS: Directory, hierarchy, hierarchical, tree, indexing, pointers, folders, books, bit map, hashing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

100+, for data structures, per se.

102, for indexing, per se, in the creation of a database.

SEE OR SEARCH CLASS:

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- 128, Surgery, 630+ for diagnostic testing and appropriate subclasses for applications of computers in the life sciences including patient monitoring and medical imaging.
 - 273, Amusement Devices: Games, for games and amusements. Classes 463 and 473 will eventually replace 273.
 - 345, Computer Graphics Processing, Operator Interface Processing, and Selective Visual Display Systems, 700- 867 for operator interfaces, per se, in particular subclasses 866 for interface customization, subclasses 764-862 for on-screen work or objects, and subclasses 810-845 for menus.
 - 358, Facsimile and Static Presentation Processing, 403 directed to facsimile document filing and retrieval system.

- 382, Image Analysis, for image recognition, transformation and sensing, per se, and applications therefor.
- 463, Amusement Devices: Games, for a specific type of amusement, recreation, or play activity.
- 472, Amusement Devices, for the amusement or recreation of human beings, and includes patents relating to devices of the type.
- 473, Amusement Devices: Games, for devices ancillary or appurtenant to games for which there is no provision in other classes.
- 700, Data Processing: Generic Control Systems or Specific Applications, 95- 212 for manufacturing applications of computers.
- 703, Data Processing: Structural Design, Modeling, Simulation, and Emulation, 13- 22 for the use of database in simulating electronic device and electrical system.
- 704, Data Processing - Speech Signal Processing, Linguistics, Language Translation, and Audio Compression /Decompression, 10 for dictionary building in machine translation systems.
- 705, Data Processing - Financial, Business Practice, Management, or Cost /Price Determination, 1+ for applications of databases in business transaction processing.
- 711, Electrical Computers and Digital Processing Systems - Memory, 1- 5 for addressing particular memory configurations and systems, subclasses 100 + for memory accessing and control, per se, and in particular subclasses 113 for disk caching, subclasses 117 + for hierarchical memory, per se, subclasses 118 + for caching, subclasses 147 + for shared memory accessing and control, subclasses 170 + for memory configuring and allocation, subclasses 200 + for address formation processing, and subclass 216 for address hashing.
- 714, Error Detection /Correction and Fault Detection /Recovery, 15+ for state recovery, per se, in particular, subclass 20 for plural recovery sets with set interrelation data.
- 715, Data Processing: Presentation Processing of Document, appropriate subclasses for document processing, per se, particularly ~~501.1~~ for processing a document including hypermedia, subclass 513 for processing a structured document (e.g., HTML, SGML, ODA, CDA), and subclasses 515-516 for compound documents.
- 716, Data Processing: Design and Analysis of Circuit or Semiconductor Mask, appropriate subclasses for the use of database in the design and analysis of circuit or semiconductor mask.

Access augmentation or optimizing:

This subclass is indented under subclass 1.

Subject matter directed to methods of access, including query path traversal, mapping, and reuse, joining tables in relational databases, view composition, index choice, bit mapping, and query reuse.

SEE OR SEARCH CLASS:

- 340, Communications: Electrical, 825.01- 825.04 for selective communications path routing.
- 701, Data Processing: Vehicles, Navigation, and Relative Location, 200+ for navigation within a physical reality.
- 704, Data Processing - Speech Signal Processing, Linguistics, Language Translation, and Audio Compression /Decompression, 10 for linguistics dictionary building.
- 705, Data Processing - Financial, Business Practice, Management, or Cost /Price Determination, 7+ for operations research, per se, including systems directed to generalized linear programming problem solving.
- 708, Electrical Computers: Arithmetic Processing and Calculating, 490+ for arithmetical processing of data.
- 709, Electrical Computers and Digital Processing Systems: Multiple Computer or Process Coordinating, 106 for identifying and dealing with run-time dependencies between executing programs, tasks, processes (e.g., data dependencies, control flow dependencies) and subclasses 201-203 for distributed data processing.
- 710, Electrical Computers and Digital Data Processing Systems: Input /Output, 131- 132 for bus path selecting in a computer or digital data processing system.
- 714, Error Detection /Correction and Fault Detection /Recovery, 4 for masking or reconfiguring of network paths.
- 715, Data Processing: Presentation Processing of Document, 501.1 for processing a document including hypermedia, subclass 513 for processing a structured document (e.g., HTML, SGML, ODA, CDA), subclasses 515-516 for compound documents, and subclass 532 for text data document processing with a dictionary.

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Query processing (i.e., searching):

This subclass is indented under subclass 1.

Subject matter directed to methods of searching for (i.e., querying) data stored as a database in a computer or digital data processing system, including sequential searching, primary and secondary index searching, and bit-map searching of inverted lists or topological maps.

- (1) Note. The combination of a database accessing method with a particular operator interface feature may be found in these subclasses. Operator interfaces, per se, are classified elsewhere.

SEE OR SEARCH CLASS:

- 178, Telegraphy, 18+ for writing systems such as, for example, digitizing tablets.
- 235, Registers, 375+ for systems controlled by data bearing

member.

- 345, Computer Graphics Processing, Operator Interface Processing, and Selective Visual Display Systems, 156+ for input devices such as mice, touch screens, etc., subclasses 700-867 for operator interfaces, per se, and in particular subclasses 764-862 for on-screen workspaces and objects, subclasses 781-807 for windowing, and subclass 808 for pop-up controls.
- 353, Optics: Image Projectors, 25 for selective optical data retrieval.
- 704, Data Processing - Speech Signal Processing, Linguistics, Language Translation, and Audio Compression /Decompression, 1+ for machine translation and linguistic data processing and subclasses 200 + for speech translation methods and apparatus.
- 706, Data Processing: Artificial Intelligence, 45- 61 for input means in a knowledge-based system.
- 715, Data Processing: Presentation Processing of Document, 530- 541 for text editing, composition or storage control.
- 717, Data Processing: Software Development, Installation, and Management, 136- 161 for program compilers and procedural language translators.

4 **Query formulation, input preparation, or translation:**

This subclass is indented under subclass 3.

Subject matter directed to methods for translating an external access to a database or files into internal access to the database or files, and translation of an external query format into an intermediate or internal query format.

SEE OR SEARCH CLASS:

- 715, Data Processing: Presentation Processing of Document, 503- 510 for spreadsheets, forms, and tables under document processing.

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Query augmenting and refining (e.g., inexact access):

This subclass is indented under subclass 3.

Subject matter directed to methods of expanding or limiting access to and retrieval of data or files by techniques including fuzzy search, ranking or weighing, relevance, thesaurus, and concept retrieval.

SEE OR SEARCH CLASS:

- 704, Data Processing - Speech Signal Processing, Linguistics, Language Translation, and Audio Compression /Decompression, 1+ for linguistic data processing and machine translation.
- 706, Data Processing: Artificial Intelligence, 1- 9 for fuzzy logic,

per se, and subclasses 15-44 for knowledge processing, per se, including trainable neural nets and expert systems.

- 710, Electrical Computers and Digital Data Processing Systems: Input /Output, 200 and 240 + for limiting access to system resources and access arbitrating.
- 711, Electrical Computers and Digital Processing Systems - Memory, 163+ for memory access limiting.
- 713, Electrical Computers and Digital Processing Systems: Support, 200+ for security in computers or digital processing systems.
- 715, Data Processing: Presentation Processing of Document, 530- 541 for text document editing, composition or storage control.

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Pattern matching access:

This subclass is indented under subclass 3.
Subject matter directed to methods employing determination of equivalence of retrieval keys and stored data by matching characteristic patterns of one data set with one or more characteristic patterns of a candidate data set.

- (1) Note. This subclass includes text searching and indexing, per se, for database. Text presentation data processing is classified elsewhere.

SEE OR SEARCH CLASS:

- 382, Image Analysis, appropriate subclasses for image recognition, transformation, and sensing, per se, and applications therefor, particularly 181+ for image pattern recognition.
- 704, Data Processing - Speech Signal Processing, Linguistics, Language Translation, and Audio Compression /Decompression, 2+ for machine translation systems.
- 705, Data Processing - Financial, Business Practice, Management, or Cost /Price Determination, 7+ for operations research, per se, including systems directed to generalized linear programming-problem-solving.
- 708, Electrical Computers: Arithmetic Processing and Calculating, 490+ for arithmetical processing, per se, and subclass 212 for detection of a particular sequence of bits.
- 709, Electrical Computers and Digital Processing Systems: Multiple Computer or Process Coordinating, 106 for identifying and dealing with run-time dependencies between executing programs, tasks, processes (e.g., data dependencies, control flow dependencies).
- 714, Error Detection /Correction and Fault Detection /Recovery, for pertinent subclass(es) as determined by schedule review.
- 715, Data Processing: Presentation Processing of Document, appropriate subclasses for document processing, per se.